Assessment of Urinary Incontinence in Pregnancy and Postpartum: Observational Study

Avaliação da Incontinência Urinária na Gravidez e no Pós-Parto: Estudo Observacional

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ABSTRACT

Introduction: The urinary incontinence can affect up to 50% of women at some stage of their lives, particularly during pregnancy and postpartum. This study was designed in order to identify and assess the prevalence and risk factors for urinary incontinence during the third trimester of pregnancy and three months postpartum.

Material and Methods: Observational and cross-sectional study. The population of the study was composed of 268 women who delivered and were admitted to the Centro Hospitalar Tâmega e Sousa in the years 2013 and 2014, and who agreed to participate in this study. Postpartum women were asked to fill out a questionnaire adapted from the International Consultation on Incontinence Questionnaire - Short Form, for urinary incontinence research in the third trimester of pregnancy. Three months after delivery, they were contacted by telephone and asked to answer the same questions about the urinary incontinence postpartum.

Results: Of the 268 women interviewed, 31 were excluded from the study, taking into account the defined inclusion and exclusion criteria. In total (n = 237), 51.89% of women included in the study, reported the occurrence of urinary incontinence during pregnancy. The prevalence of urinary incontinence in pregnancy by parity (primiparous *versus* multiparous) was statistically significant ($p = 0.006$). At postpartum (n = 237), 28.69% of women with urinary incontinence had vaginal delivery and 5.91% of women underwent cesarean delivery ($p = 0.001$). In these group of women with postpartum urinary incontinence (n = 82), 31.69% have had urinary incontinence only in the postpartum and 68.31% of women have had symptoms during pregnancy ($p < 0.001$).

Discussion: This study demonstrates the high prevalence of urinary incontinence in pregnancy and the respective decrease in postpartum.

Conclusion: Multiparity and occurrence of urinary incontinence in pregnancy appear as potential risk factors in the emergence of the urinary incontinence.

Keywords: Postpartum Period; Pregnancy; Pregnancy Complications; Urinary Incontinence

RESUMO

Introdução: A incontinência urinária pode afetar até 50% das mulheres em alguma fase das suas vidas, nomeadamente durante a gravidez. Este estudo foi desenhado com a finalidade de identificar e avaliar a prevalência e fatores de risco para incontinência urinária durante o terceiro trimestre da gravidez e três meses após o parto.

Material e Métodos: Estudo observacional e transversal. A população do estudo incluiu 268 puérperas, que tiveram parto no Centro Hospitalar Tâmega e Sousa, em 2013 e 2014. Foram avaliadas durante o período de internamento após o parto. As parturientes foram convidadas a preencher um questionário adaptado, *International Consultation on Incontinence Questionnaire - Short Form*, para investigação da incontinência urinária no terceiro trimestre da gravidez, para o qual deram consentimento. Três meses após o parto, foram contactadas telefonicamente e convidadas a responder às mesmas questões acerca da incontinência urinária no pós-parto.

Resultados: Das 268 mulheres entrevistadas, 31 foram excluídas do estudo, tendo em conta os critérios de inclusão e exclusão definidos. No total (n = 237), 51,89% das mulheres incluídas no estudo, relataram a ocorrência de incontinência urinária durante a gravidez. A prevalência da incontinência urinária na gravidez, segundo a paridade (primíparas versus multíparas), foi estatisticamente significativa ($p = 0,006$). No pós-parto (n = 237), 28,69% das mulheres com incontinência urinária tiveram parto vaginal e 5,91% das mulheres foram submetidas a cesariana ($p = 0,001$). Neste grupo de mulheres com incontinência urinária pós-parto (n = 82), 31,69% apresentaram incontinência urinária de novo e 68,31% das mulheres já apresentavam sintomatologia durante a gravidez ($p < 0,001$).

Discussão: Este estudo demonstra a elevada prevalência da incontinência urinária na gravidez e a respetiva redução no pós-parto.

Conclusão: A multiparidade e a ocorrência de incontinência urinária na gravidez surgem como possíveis fatores de risco no aparecimento da incontinência urinária.

Palavras-chave: Complicações na Gravidez; Gravidez; Incontinência Urinária; Período Pós-Parto

INTRODUCTION

Approximately 50% of women can be affected by urinary incontinence at some time in their lives.[1] Increased susceptibility to the development of urinary incontinence (UI) can be found in pregnancy, due to underlying anatomical and physiological changes. It was defined by the International Continence Society (ICS) as any involuntary leakage of urine and is usually classified as effort or stress incontinence (associated with the Valsalva manoeuvre and physical activity) and / or urge incontinence (related to a strong and sudden need to urinate).[2]

A prevalence of UI ranging between 0.7 and 35% has been found during pregnancy, with a more relevant impact during the third trimester and significantly decreasing in postpartum.[2-4]

Pregnancy and delivery have historically been considered as risk factors for the development of UI in

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Table 1 – Characteristics of our group of patients

Variable	Distribution
Age (years)	29.25 ± 5.66
Body mass index before pregnancy (kg/m^2)	25.12 ± 4.05
Body mass index, third trimester (kg/m^2)	31.04 ± 4.95
Parity	
Primiparous	108 (45.60%)
Multiparous (no more than 2 pregnancies)	126 (53.16%)
Multiparous (≥ 3 pregnancies)	3 (1.26%)

women. Its underlying physiopathology remains unclear, even though some etiological factors have been described, namely related to the endocrine system, to changes in the urethrovesical angle or to other anatomical and functional pelvic floor disorders.[5]

Even though not directly life-threatening, UI is associated with a relevant psycho-social impact, significantly affecting women's quality of life. Nevertheless, it is not always recognised and is frequently underdiagnosed and undertreated.

This study aimed at the identification and assessment of the prevalence and potential risk factors for UI during the third trimester of pregnancy and three months after delivery.

MATERIAL AND METHODS

This is an observational and cross-sectional study involving a group of 268 pregnant mothers having been admitted to give birth at the *Centro Hospitalar Tâmega e Sousa* in 2013 and 2014 and having accepted to participate in the study. All the participants have previously given their informed consent in written form. The study was approved by the Ethics Committee of the Hospital Centre. According with study inclusion criteria, (i) patients aged 18 and over, (ii) fluent in written and spoken Portuguese, (iii) currently not on parasympathomimetic or sympatholytic drugs and (iv) with no diabetes mellitus were involved in the study. The presence of (i) previous history of urinary incontinence, (ii) urinary tract infections or (iii) urogynaecology surgery, (iv) current preterm labour, (v) multiple pregnancy and (vi) foetal death were study exclusion criteria.

Women who remained in the hospital upon delivery were invited to participate in the study. Patient demographic characteristics (body weight and height, presence of comorbidities) and obstetric patient history were recorded. After a brief explanation and upon signing the informed consent, participants were asked to respond to an individual, anonymous and adapted International Consultation on Incontinence Questionnaire – Short Form (ICIQ-SF), which was validated for UI research.[6] Three months after delivery, participants were contacted by phone and were asked to respond to the same questionnaire [http://www.actamedicaportuguesa.com/revista/index.php/amp/article/view/7371/5108]. In addition, in the presence of UI, participants were asked about any advice that they had sought during pregnancy and in postpartum period.

SPSS® software, version 22.0 has been used for data analysis and *p*-values < 0.05 were considered as statistically significant. Student's t-test was used to compare the presence *vs.* the absence of UI in groups of patients and to compare quantitative variables. Chi-square test has been used for group comparison regarding qualitative variables.

RESULTS

From a total of 268 pregnant mothers, 31 were initially excluded from the study, as per the inclusion criteria. The characteristics of our group of participants are shown in Table 1. The presence of UI during pregnancy has been described by 51.89% of the 237 participants included in the study and stress UI was predominant when compared to urge or mixed UI (82.11% *vs.* 17.88%) (Fig. 1).

Statistically significant differences were found between parity and UI during pregnancy ($p = 0.006$, Fig. 2).

The absence of any approach to the symptoms of urinary incontinence during prenatal care has been described by 48.5% of the participants.

A 34.6% prevalence rate of postpartum UI (82/237) has been found and stress UI was also predominant (82.93%) when compared with urge or mixed UI (9.76% and 15.85%, respectively).

Patients were divided into three groups (Total sample, Primiparous mothers and Patients with de novo postpartum UI) in order to allow for the identification of an association between the mode of delivery and other factors with the presence of postpartum UI (Table 2). Statistically significant differences between the presence of UI and the mode of delivery has been found when total sample has been analysed (n = 237; $p = 0.001$) and particularly regarding

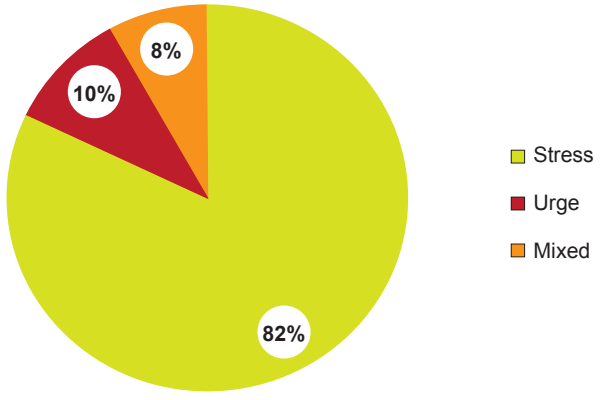

Figure 1 – Prevalence of urinary incontinence during pregnancy (n = 123) according with the type

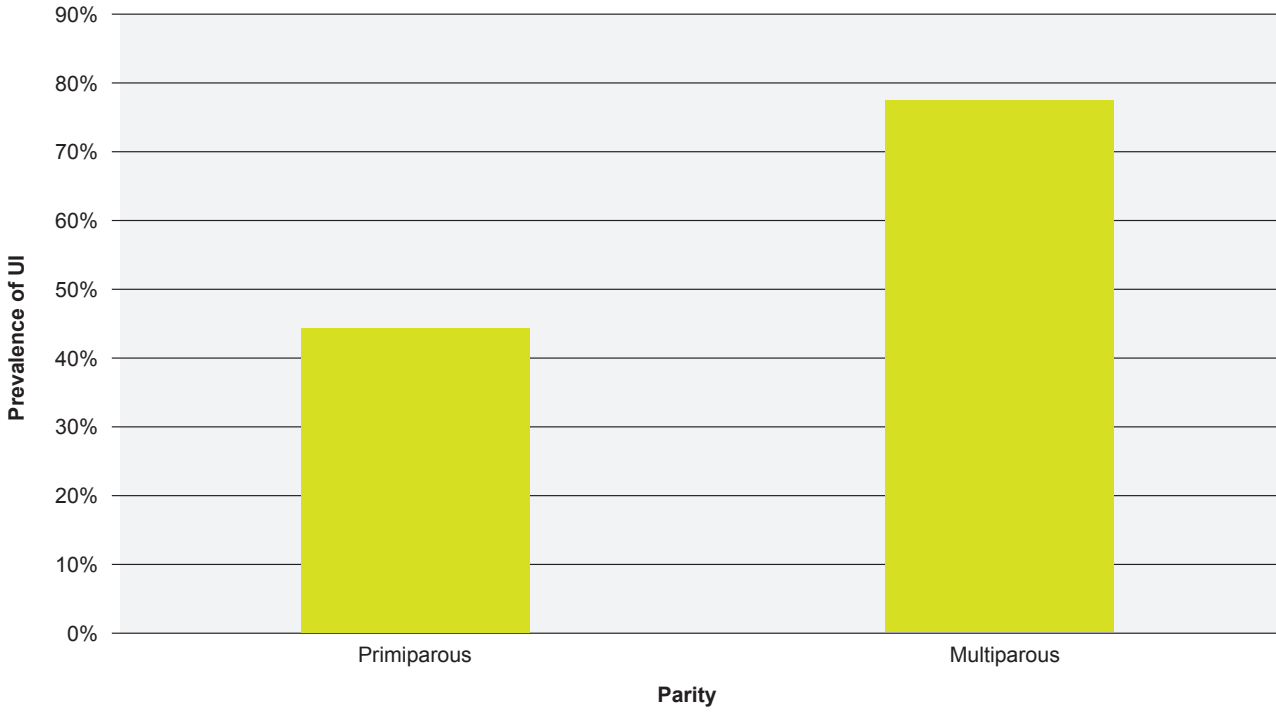

Figure 2 – Prevalence of urinary incontinence in pregnancy (n = 237), according with parity (p = 0.006)

the group of patients presenting with symptoms of de novo postpartum UI (n = 115; p = 0.017). No significant correlation between any of the remaining factors that were analysed in the study (namely the use of episiotomy, the presence of a perineal tear and birth weight) and the symptoms of postpartum UI in the three groups were found (p > 0.005).

De novo postpartum UI was found in 31.69% of the patients in the group with postpartum UI (n = 82) and 68.31% already presented with symptoms during pregnancy (p < 0.001; Fig. 3). A 73.41% of patients with UI did not seek for any medical advice in postpartum period.

DISCUSSION

A 51.89% prevalence of UI during the third trimester of pregnancy was found in this study, in line with what has been found in other studies showing rates ranging between 18.6 and 75%.[7-9] These differences can be explained by the different methodologies used for the assessment of UI, by variations regarding the stage of pregnancy in which UI was analysed as well as by the influence of genetic and environmental factors. Apart from that, this variability also allowed for the conclusion that pregnancy-related physiological changes do not induce UI in every women. Hilde *et al.* have found changes in manometry of pelvic floor muscles in nulliparous women with UI, suggesting that the pelvic floor strength can be impaired by different factors apart from pregnancy.[10] As described in literature, stress UI is the most frequently found in pregnancy,[11] even though the exact mechanism leading to the development of UI during pregnancy remains unclear[12] and mechanical and endocrine changes have been described. Mechanical changes are related to an increased intra-abdominal pressure and subsequent effects on the pelvic floor.[13-15] In addition, the characteristic hormone balance found in pregnancy (increased progesterone levels) also has a relaxing effect on the smooth muscles of the pelvic floor and is associated with a reduction in the levels of collagen.[16,17]

Different authors have also found a significant

Table 2 – Variables related to postpartum urinary incontinence (UI) regarding the total number of participants, the group of primiparous mothers and the group of patients presenting with *de novo* postpartum UI

Variables	Sample total (n = 237)			Primiparous mothers (n = 108)			*de novo* UI (n = 115)		
	No UI	With UI	*p*-value	No UI	With UI	*p*-value	No UI	With UI	*p*-value
Mode of delivery Vaginal Caesarean-section	41.35% 24.05%	28.69% 5.91%	0.001	49.07% 29.63%	15.74% 5.55%	0.219	42.61% 33.91%	18.26% 4.35%	0.017
Episiotomy	37.13%	23.21%	0.081	45.37%	15.74%	0.319	41.74%	16.52%	0.212
Perineal tear	12.66%	6.33%	0.149	17.59%	4.62%	0.430	12.17%	4.35%	0.461
Birth weight ≥ 4,000 gr < 4,000 gr	4.22% 61.18%	1.26% 33.33%	0.282	2.78% 75.92%	0% 21.30%	0.484	2.61% 73.91%	2.61% 20%	0.131

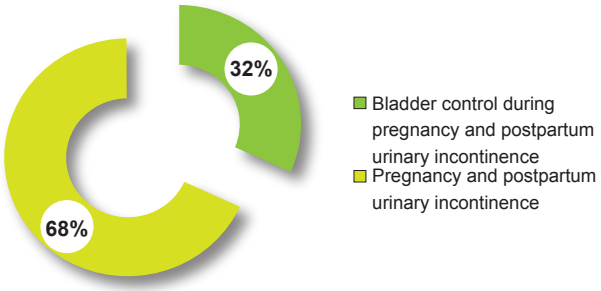

Figure 3 – Prevalence of postpartum urinary incontinence ($p < 0.001$)

association between multiparity and the presence of UI, in line with the results of this study.[18,19] According with literature, the results support the hypothesis that pregnancy has on its own a negative cumulative effect on the different components of the pelvic floor muscles.

UI can remain for around 4-6 weeks after delivery, with a significant impact on women's quality of life. Lower prevalence of postpartum UI is globally found when compared to UI during pregnancy (6.8% *vs.* 42%) and depends on timing of medical assessment, with a trend for a decrease over longer periods of time.[20-24] In addition, the prevalence of postpartum UI is significantly higher when symptoms already exist during pregnancy, as found by Martin-Martin S *et al*.[25]

Historically, vaginal delivery has been associated with an increased risk of UI associated with childbirth injury to the pudendal nerve,[26,27] even though more recent studies have shown that the risk of UI is not reduced in caesarean-section delivery, when compared to the vaginal delivery.[27-29] Our study's results showed a statistically significant difference between the mode of delivery and the presence of UI in both groups (with and without UI during pregnancy). However, multiparity can represent a confounding factor, as this association was not found in the group of primiparous women. The use of episiotomy, the presence of a perineal tear and birth weight were not associated with the presence of UI. In accordance with current knowledge, the use of episiotomy is a relevant subject for discussion, even though most studies have shown similar results to those found in our study.[30-32] As regards the remaining factors, some authors also did not find any association between postpartum UI and the presence of a perineal tear or a birth weight over 4,000 gr.[31-34]

It should be mentioned the fact that a significant percentage of patients were not given any sort of advice on UI during pregnancy and that most of the patients with postpartum UI did not seek for any medical advice.

The fact that all data were based on a subjective assessment of patients (by interview or by phone) is one of the limitations of the study. In addition, the small number of women in some of the subgroups did not allow for significant results and any definitive conclusion regarding risk factors for urinary incontinence.

CONCLUSION

A high prevalence of UI during pregnancy and lower prevalence in postpartum period have been found in this study; multiparity and the presence of UI during pregnancy were potential risk factors for the development of UI. The relevance of multidisciplinary healthcare and health education should be reinforced, aimed at the prevention and treatment of the disorders of the pelvic floor during pregnancy.

HUMAN AND ANIMAL PROTECTION

The authors declare that the followed procedures were according to regulations established by the Ethics and Clinical Research Committee and according to the Helsinki Declaration of the World Medical Association.

DATA CONFIDENTIALITY

The authors declare that they have followed the protocols of their work centre on the publication of patient data.

CONFLICTS OF INTEREST

The authors declare that there were no conflicts of interest in writing this manuscript.

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